

09/15/25
1 of 9

CTGTCTTGGGCAGCTCAGAGAGAGAACATTTCTTTTCTTTTCTTTTTGATTTTTTTTGGGGTGGAGTCT
CACCTGTGTTGCCAGGTTGGAGGGTGTGATCTCGGCACACTGCGGCCTCCACCTCCCAGGCTCAAGCGATT
TCATGCCCTAGCCTCTCGAGTAGCTGGGACTGTAGCTGTGCACCACCACGCCTGGATAGTTTTTGTGTTTTT
AGTGGAGACGGGGTTTTACCATGTTGGCCGGGCTGGTCTTGAACCTCTGACCTCAACTGATTTGCCTGCCTT
GATCTCCCAAAGTGCTGGGATTACAGGTATCGAGAACCTTCCCTGCGAACTTCAGAGGAACTTCCAGCTGAT
GCGAGAGCTGGACCAGAGGACGGAAGATAAGAAAGCAGAGATTGACATCCTGGCTGCAGAGTACATCTCCAC
GGTGAAGACGCTGTCTCCAGACCAGCGCGTGGAGCGCTGCAGAAGATCCAGAAAGCCTACAGCAAGTGCAA
GGAATACAGTGACGACAAAGTGCAGCTGGCCATGCAGACCTACGAGATGGTGGATAAACACATTCTGAAGGCT
TGATGCAGACCTGGCGCGCTTTGAAGCAGATCTGAAGGACAAGATGGAGGGCAGTGATTTTGAAAGCTCCGG
AGGGCGAGGGTTAAAAAAGGCCGGGGTCAGAAAAGAAAAAGAGGGTCCCGGGGCCGAGGCAGGAGGACATC
AGAGGAAGACACACCAAAGAAAAAGAAGCACAAAGGAGGGTCTGAGTTCACTGACACCATCCTGTCCGTGCA
CCCCCTCTGATGTGCTGGACATGCCCCGTGGACCCAAACGAACCCACGTACTGCCTGTGCCACCAGGTCTCCTA
TGGGGAGATGATTGGCTGTGACAATCCAGACTGTCCAATTGAGTGGTTTTCACTTTGCCTGCGTGGACCTTAC
CACGAAACCCAAAGGAAAATGGTTCTGTCCACGGTGTGTCCAGGAAAAGAGGAAGAAGAAGTAGGAGGAGCT
GTGTGCCCCGGATCCGAGGAGCAAGTTAATCTGTCCCTTCATTCGTGTCGCAATATTTCCCTTCCTTTTAAAA
CTACCTTGTTCCGTTGATACTTAGTAAC

figure 1

1 MRELDQRTEDKKAEIDILAAEYISTVKTLSPDQRVERLQKIQNAYSKCKEYSDDKVQLAM
61 QTYEMVDKHIRRLDADLARFEADLKDKMEGSDFFESSGGRGLKKGRGQKEKRGSRGRGRRT
121 SEEDTPKKKKHKGGSEFTDTILSVHPSDVLDPVDPNEPTYCLCHQVSYGEMIGCDNPDC
181 PIEWFHFACVDLTTKPKGKWFCPRCVQEKRRKKZ

figure 2

09/15/25 11:00

TGCTGA CCTCAGCCCTGGCGTGGGCATAGGAGGGTCTGCGTGGCTGAGCATCCAGTGTCTTCGTACTGCCA
CTGACAGCCTCAGGCCTGATTTCCAGCACTGTCTGTCCAGGAGCAATG GGGAGCAAGAGTCACTCCACAAGAC
TCTGGAGGCCTGATAGGTATCGAGAACCTTCCCTGCGAACTTCAGAGGAACCTCCAGCTGATGCGAGAGCTG
GACCAGAGGACGGAAGATAAGAAAGCAGAGATTGACATCCTGGCTGCAGAGTACATCTCCACGGTGAAGACG
CTGTCTCCAGACCAGCGCGTGGAGCGCCTGCAGAAGATCCAGAACGCCTACAGCAAGTGCAAGGAATACAGT
GACGACAAAGTGCAGCTGGCCATGCAGACCTACGAGATGGTGGATAAACACATTCTGAAGGCTTGATGCAGAC
CTGGCGCGCTTTGAAGCAGATCTGAAGGACAAGATGGAGGGCAGTGATTTTGAAGCTCCGGAGGGCGAGGG
TAAAAAAAGGCCGGGGTCAGAAAGAAAAAGAGGGTCCCGGGGCCGAGGCAGGAGGACATCAGAGGAAGAC
ACACCAAAGAAAAAGAAGCACAAAGGAGGGTCTGAGTTCACTGACACCATCCTGTCCGTGCACCCCTCTGAT
GTGCTGGACATGCCCGTGGACCCAAACGAACCCACGTACTGCCTGTGCCACCAGGTCTCCTATGGGGAGATG
ATTGGCTGTGACAATCCAGACTGTCCAATTGAGTGGTTTCACTTTGCCTGCGTGGACCTTACCACGAAACCC
AAAGGAAAATGGTGA

figure 3

1 MGARVTPQDSGGLIGIENLPCELQRNFQLMRELDQRTEDKKAIEDILAAEYISTVKTLSP
61 DQVERLQKIQNAYSKCKEYSDDKVQLAMQTYEMVDKHIRRLDADLARFEADLKDKMEGS
121 DFESSGGRGLKKGRGQKEKRGSRGRGRRTSEEDTPKKKKHKGGSEFTDTILSVHPSDVLD
181 MPVDPNEPTYCLCHQVSYGEMIGCDNPDCPIEWFHFACVDLTTPKPGKWZ

figure 4

09715725 " 11.1600

TGCTGACCTCAGCCCTGGCGTGGGCATAGGAGGGTCTGCGTGGCTGAGCATCCAGTGTCTTCGTACTGCCA
 CTGACAGCCTCAGGCCTGATTTCCAGCACTGTCTGTCCAGGAGCAATGGGAGCAAGAGTCACTCCACAAGAC
 TCTGGAGGCCTGATAGGTATCGAGAACCTTCCCTGCGAACTTCAGAGGAAGTTCAGCTGATGCGAGAGCTG
 GACCAGAGGACGGAAGATAAGAAAGCAGAGATTGACATCCTGGCTGCAGAGTACATCTCCACGGTGAAGACG
 CTGTCTCCAGACCAGCGCGTGGAGCGCCTGCAGAAGATCCAGAACGCCTACAGCAAGTGCAAGGAATACAGT
 GACGACAAAGTGAGCTGGCCATGCAGACCTACGAGATGGTGGATAAACACATTCTGAAGGCTTGATGCAGAC
 CTGGCGCGCTTTGAAGCAGATCTGAAGGACAAGATGGAGGGCAGTGATTTTGAAAGCTCCGGAGGGCGAGGG
 TTAAAAAAGGCCGGGGTCAGAAAGAAAAAGAGGGTCCCGGGGCCGAGGCAGGAGGACATCAGAGGAAGAC
 ACACCAAAGAAAAAGAAGCACAAAGGAGGGTCTGAGTTCACTGACACCATCCTGTCCGTGCACCCCTCTGAT
 GTGCTGGACATGCCCCGTGGACCCAAACGAACCCACGTACTGCCTGTGCCACCAGGTCTCCTATGGGGAGATG
 ATTGGCTGTGACAATCCAGACTGTCCAATTGAGTGGTTTCACTTTGCCTGCGTGGACCTTACCACGAAACCC
 AAAGGAAAATGGTGA

figure 5

1 MGARVTPQDSGGLIGIENLPCELQRNFQLMRELDQRTEDKKAEIDILAAEYISTVKTLS
 61 DQVERLQKIQNAYSKKEYSDDKVQLAMQTYEMVDKHIRRLDADLARFEADLKDKMEGS
 121 DFESSGGRGLKKGRGQKEKRGSRGRGRRTSEEDTPKKKKHKGGSEFTDTILSVHPSDVLD
 181 MPVDPNEPTYCLCHQVSYGEMIGCDNPDCPIEFHFACVDLTTKPKGKWZ

figure 6

09715725-11600

1 TTTGCTGACCTCAGCCCTGCGTGGGCGTATTGAGGGTCTGCGTGGCTGAGCATCCAGTGT
 61 CCTTCGTACTGCCACTGACAGCCTCAGGCCTGATTTCCAGCACTGTCTGTCCAGGAGCAA
 121 TGGGAGCAAGAGTCACTCCACGAGACTCTGGAGGCCTGATAGGTATCGAGAACCTTCCCT
 181 GCGAACTTCAGAGGAACCTCCAGCTGATGCGAGAGCTGGACCAGAGGACGGAAGATAAGA
 241 AAGCAGAGATTGACATCCTGGCTGCAGAGTACATCTCCACGGTGAAGACGCTGTCTCCAG
 301 ACCAGCGCGTGGAGCGCCTGCAGAAGATCCAGAACGCCTACAGCAAGTGCAAGGAATACA
 361 GTGACGACAAAGTGCAGCTGGCCATGCAGACCTACGAGATGGTGGATAAAACACATTTCGAA
 421 GGCTTGATGCAGACCTGGCGCGCTTTGAAGCAGATCTGAAGGACAAGATGGAGGGCAGTG
 481 ATTTTGAAAGCTCCGGAGGGCGAGGGTTAAAAAAGGCCGGGGTCAGAAAGAAAAAGAG
 541 GGTCCCGGGGCCGAGGCAGGAGGACATCAGAGGAAGACACACCAAAGAAAAAGAAGCACA
 601 AAGGAGGGTCTGAGTTCACTGACACCATCCTGTCCGTGCACCCCTCTGATGTGCTGGACA
 661 TGCCCGTGGACCCAAACGAACCCACGTACTGCCTGTGCCACCAGGTCTCCTATGGGGAGA
 721 TGATTGGCTGTGACAATCCAGACTGTCCAATTGAGTGGTTTCACTTTGCCTGCGTGGACC
 781 TTACCACGAAACCCAAAGGAAAATGGTTCTGTCCACGGTGTGTCCAGGAAAAGAGGAAGA
 841 AGAAGTAGGAGGAGCTGTGTGCCCCGATCCGAGGAGCAAGTTAATCTGTCCCTTCATTCTG
 901 TGTCGCAATATTTCCCTTCCTTTTAAAACTACCTTGTTTCGGTTGATACTTAGTAACAA

figure 7

1 MGARVTPQDSGGLIGIENLPCELQRNFQLMRELDQRTEDKKAEIDILAAEYISTVKTLSP
 61 DQERVERQQKIQNAYSKCKEYSDDKVQLAMQTYEMVDKHIRRLDADLARFEADLKDKMEGS
 121 DFESSGGRGLKKGRGQKEKRGSRGRGRRTSEEDTPKKKKHKGGSEFTDTILSVHPSDVLD
 181 MPVDPNEPTYCLCHQVSYGEMIGCDNPDCEIWFHFACVDLTTPKPGKWFCPRCVQEKRK
 241 KKZ

figure 8

CTGTCTTGGGCAGCTCAGAGAGAGAACATTTCTTTTCTTTTCTTTTTGATTTTTTTTTGGGGTGGAGTCT
CACCTGTGTTGCCCAGGTTGGAGGGTGTGATCTCGGCACACTGCGGCCTCCACCTCCCAGGCTCAAGCGATTC
TCATGCCCTAGCCTCTCGAGTAGCTGGGACTGTAGCTGTGCACCACCACGCCTGGATAGTTTTTGTGTTTTT
AGTGGAGACGGGGTTTCACCATGTTGGCCGGGCTGGTCTTGAACCTTGACCTCAACTGATTTGCCTGCCTT
GATCTCCCAAAGTGCTGGGATTACAGGTATCGAGAACCTTCCCTGCGAACTTCAGAGGAACTTCCAGCTGAT
GCGAGAGCTGGACCAGAGGACGGAAGATAAGAAAGCAGAGATTGACATCCTGGCTGCAGAGTACATCTCCAC
GGTGAAGACGCTGTCTCCAGACCAGCGCGTGGAGCGCTGCAGAAGATCCAGAAGCCTACAGCAAGTGCAA
GGAATACAGTGACGACAAAGTGCAGCTGGCCATGCAGACCTACGAGATGGTGGATAAACACATTCTGAAGGCT
TGATGCAGACCTGGCGCGCTTTGAAGCAGATCTGAAGGACAAGATGGAGGGCAGTGATTTTGAAGCTCCGG
AGGGCGAGGGTTAAAAAAAGGCCGGGGTCAGAAAGAAAAAGAGGGTCCCGGGGCCGAGGCAGGAGGACATC
AGAGGAAGACACACCAAAGAAAAAGAAGCACAAAGGAGGGTCTGAGTTCACTGACACCATCCTGTCCGTGCA
CCCCTCTGATGTGCTGGACATGCCCCGTGGACCCAAACGAACCCACGTACTGCCTGTGCCACCAGGTCTCCTA
TGGGGAGATGATTGGCTGTGACAATCCAGACTGTCCAATTGAGTGGTTTCACTTGCCTGCGTGGACCTTAC
CACGAAACCCAAAGGAAAATGA

figure 9

1 MRELDQRTEDKKAEIDILAAEYISTVKTLSPDQERVERLQKIQNAYSKCKEYSDDKVQLAM
61 QTYEMVDKHIRRLDADLARFEADLKDKMEGSDFESSGGRGLKKGRGQKEKRGSRGRGRRT
121 SEEDTPKKKKHKGGSEFTDTILSVHPSVDLMPVDPNEPTYCLCHQVSYGEMIGCDNPDC
181 PIEWFHFACVDLTTKPKGKZ

figure 10

09715725 " 111600

ING2: A New Family of p33ING Homologs

1	ING2B	-----MGARTPQDS-----GGIIGIENIP-CEIQNFQLMR--EIDQO
1	ING2C	-----MGARTPQDS-----GGIIGIENIP-CEIQNFQLMR--EIDQO
1	ING2A	-----MR-----EIDOR
1	P33ING-1	-----MLSPAN-----GEQHLLVNY-VEDYDSDIESDF-FDIQRNVSLMR--EIDAK
1	P33ING1-2	1 MPLCTATRIPRYSSSSDP-GPVAGRGCG-SSDRPPRPGAGFARQIAASLTIRGCGWGPW
1	ING1LP	1 --MLGQQQQQLYSSAALITGERSELLTCYVDYECEVESDE-HDMQRNVSLIR--EIDNK
1	consensus	1 s g r v n d l i e l p e i q r n l m R e i d q r
37	ING2B	TEDKKAIEDIIAAEYISVKTLSDPORVERLQIKQNAYSCKEYSDDKVQIAMOTVEAVD
37	ING2C	TEDKKAIEDIIAAEYISVKTLSDPORVERLQIKQNAYSCKEYSDDKVQIAMOTVEAVD
8	ING2A	TEDKKAIEDIIAAEYISVKTLSDPORVERLQIKQNAYSCKEYSDDKVQIAMOTVEAVD
44	P33ING-1	4 YEILKEIDECEVERFS---RETGAQKRRLHCWRALLESQELGDKIOIVSOMVELIVE
59	P33ING1-2	59 WKQILKEIDECEVERES---RETDGAQKRRLHCWRALLESQELGDKIOIVSOMVELIVE
56	ING1LP	56 YQETLKIEDDYVEKYK---KEDDLNOKRKRLQQLLRALINSQELGDKIOIVTQMELIVE
61	consensus	61 tedk EIdil eyistvk l pdQrv rlqkiQ A k E DdkvQl mQ yEmvd
97	ING2B	KHIRRLDADLARFEADIKD-KMEGSDFFESSGGRG-----LKKGRGOK-EKR
97	ING2C	KHIRRLDADLARFEADIKD-KMEGSDFFESSGGRG-----LKKGRGOK-EKR
68	ING2A	68 KHIRRLDADLARFEADIKD-KMEGSDFFESSGGRG-----LKKGRGOK-EKR
101	P33ING-1	101 NRTRQVDSHVETFEAQOGLDGTVGNSGKVCADEPNNGDAVAQSDDSPNSKPSRPQPNNRE
116	P33ING1-2	116 NETRQVDSHVETFEAQOGLDGTVGNSGKVCADEPNNGDAVAQSDDSPNSKPSRPQPNNRE
113	ING1LP	113 NEARQVDELHSQCQDPABES-ERASDKAKMDSSQP-----ER-SRRRPRRORTSERLD
121	consensus	121 hiR ida larReadl d kmegsdff ssgrg dk skgr Qx Ekre
141	ING2B	-GSRGRGRTSEEDTPPKKKKHKGSEFTDT-IILSVHPSPDVLDMPVPDPNEPTYCLCHQVS
141	ING2C	-GSRGRGRTSEEDTPPKKKKHKGSEFTDT-IILSVHPSPDVLDMPVPDPNEPTYCLCHQVS
112	ING2A	-GSRGRGRTSEEDTPPKKKKHKGSEFTDT-IILSVHPSPDVLDMPVPDPNEPTYCLCHQVS
161	P33ING-1	161 NASSNHDDGASGTPBEKAKRTSKKKKRSKAKAREASPADIPIPDNPNEPTYCLCHQVS
176	P33ING1-2	176 NASSNHDDGASGTPBEKAKRTSKKKKRSKAKAREASPADIPIPDNPNEPTYCLCHQVS
163	ING1LP	163 LCHMANGTEDCDIQPPKPBSKSKKKKKRSKAKOBREASPEFAIDPDNPNEPTYCLCHQVS
181	consensus	181 gsrgrrr seedtpk KKhkgg tk s h ldmpvdpneptyclc QVSy
199	ING2B	GEMIGCDNDCPIEFWFHFA-CVDLTTKPKGKW-----
199	ING2C	GEMIGCDNDCPIEFWFHFA-CVDLTTKPKGKW-----
170	ING2A	GEMIGCDNDCPIEFWFHFA-CVDLTTKPKGWECPCVCQEKRRKK-----
221	P33ING-1	221 GEMIGCDNDCEPIEFWFHSCVGLNHKPKGWYCPCRGENEKTMDKALEKSKKRAYNR
236	P33ING1-2	236 GEMIGCDNDCEPIEFWFHSCVGLNHKPKGWYCPCRGENEKTMDKALEKSKKRAYNR
223	ING1LP	223 GEMIGCDNEQCPIEWFHSCVSLTYKPKGWYCPKCRGDNEKTMDKSTEXTKKDRSR-
241	consensus	241 GEMIGCDNdcpiEFWFH Cvdlttkpgkwycpcrgenektmdk ekskker

ING2 Activates p53

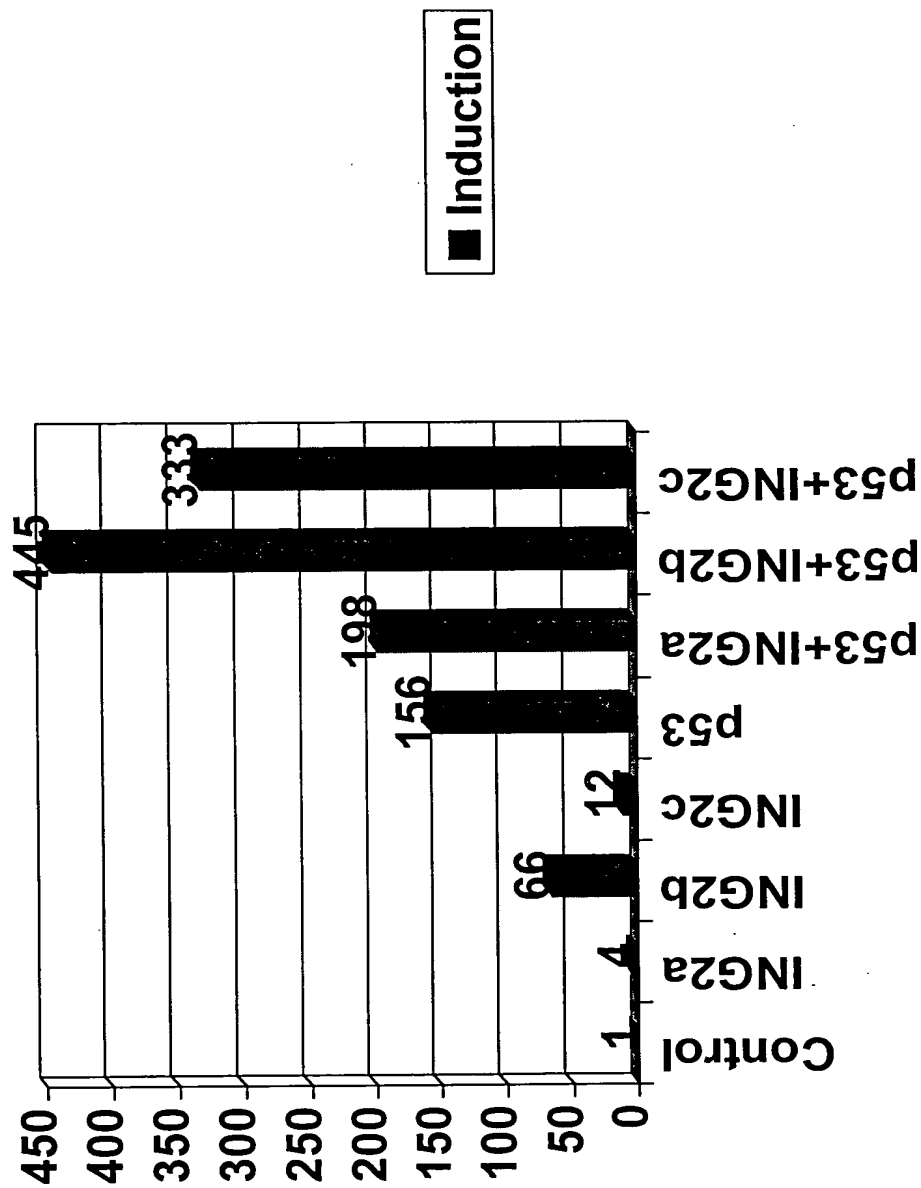


FIGURE 12.